

# Communication



© 2003 Jason Jones

# Communication

- Chemical communication
- Acoustic communication
- Visual communication

# Communication

- Chemical communication
- Acoustic communication
- Visual communication

# Communication

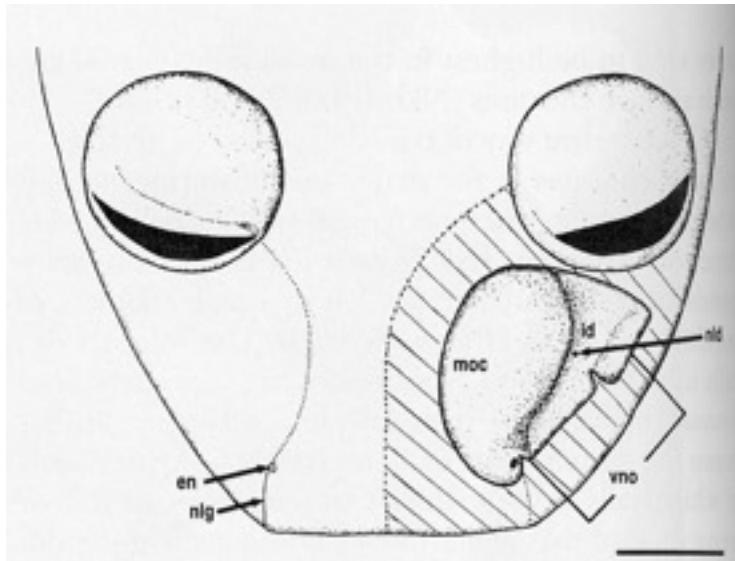
- Chemical communication
- Acoustic communication
- Visual communication

# Chemical Communication

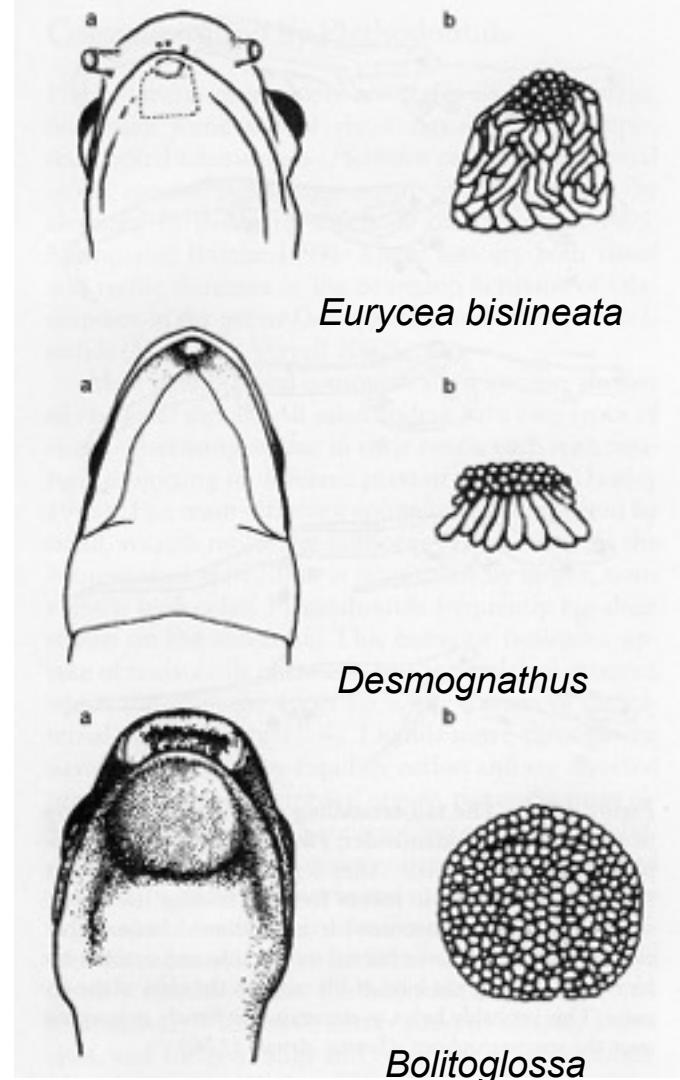
- Most chemical communication in herps involves pheromones
- Pheromones: chemicals that trigger a behavioral response in another individual
- Elaborate behaviors are associated with giving and receiving chemical signals

# Chemical Communication in Plethodontids

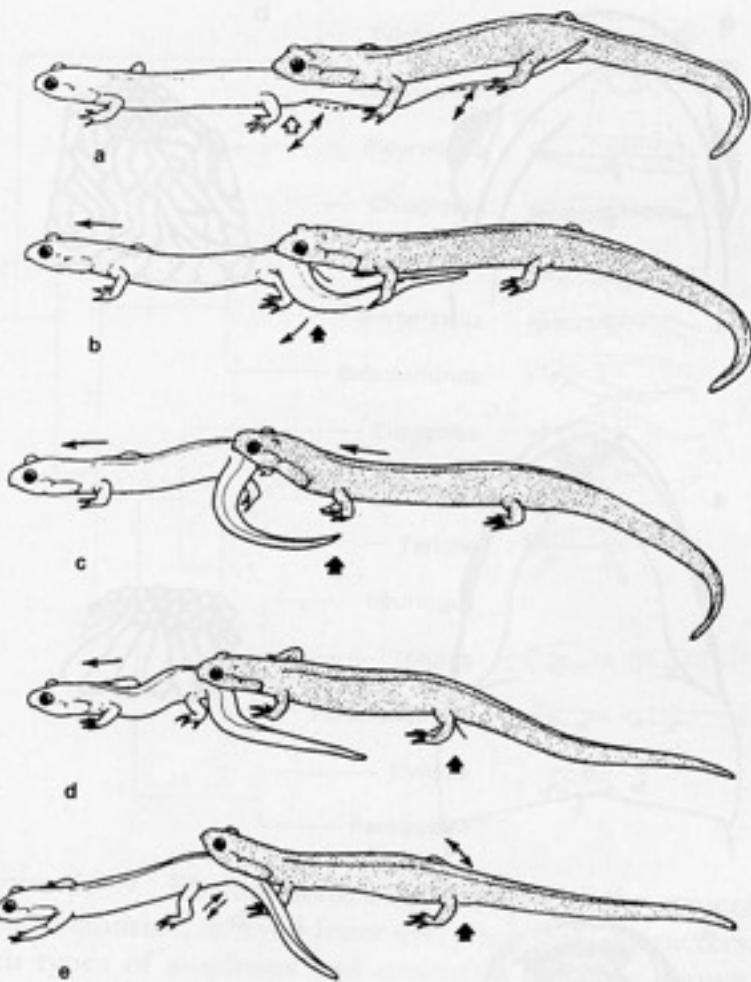
- Two chemical sensing organs: olfactory epithelium (airborne) and vomeronasal epithelium (larger, non-airborne molecules)
- Tap nose on ground to uptake nonvolatile chemicals in nasolabial grooves



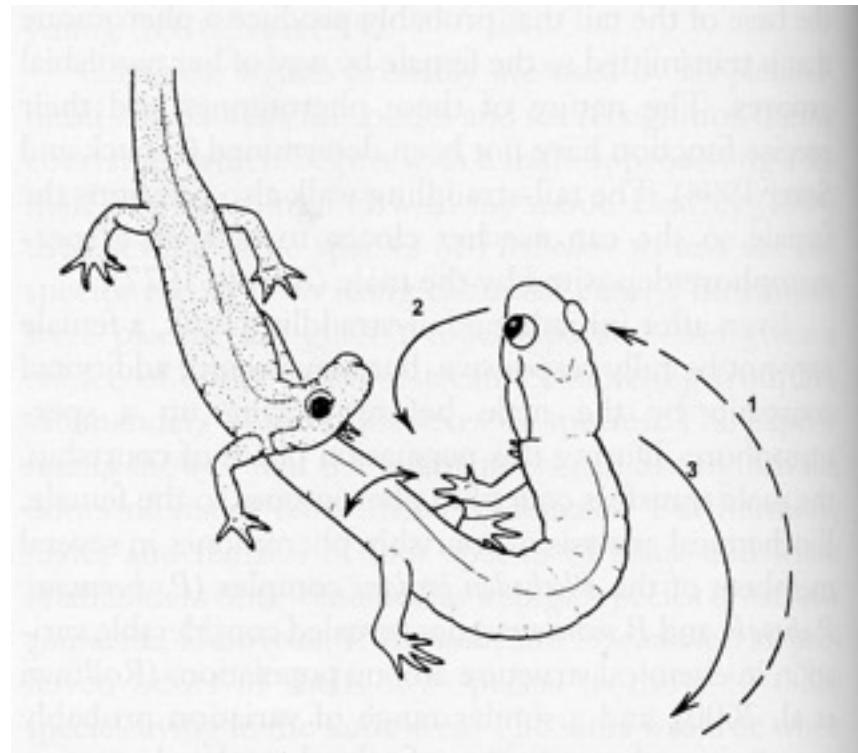
Nasal organ of red-backed salamander,  
*Plethodon cinereus*



Mental glands in  
three species of  
plethodontids



Tail-straddling walk during courtship in *Plethodon jordani*



Mental gland slapping in *Plethodon jordani*



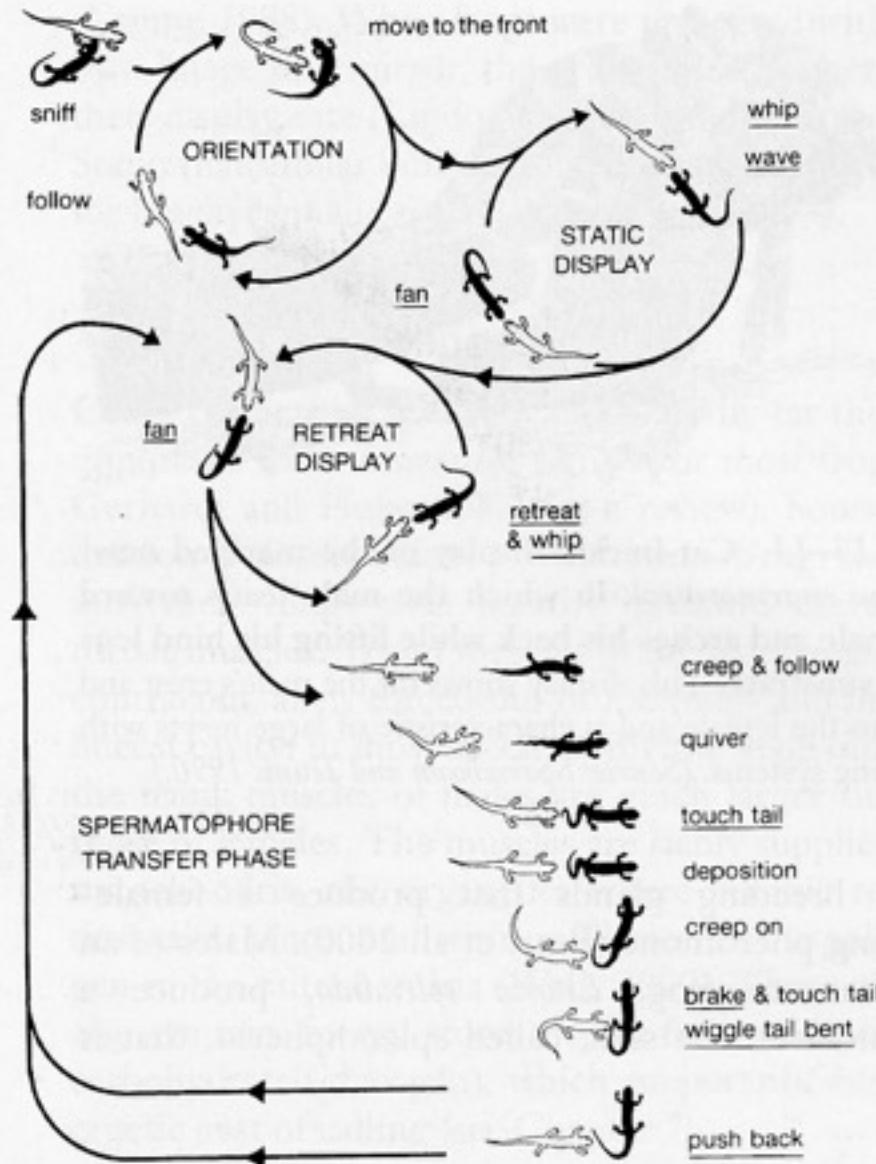
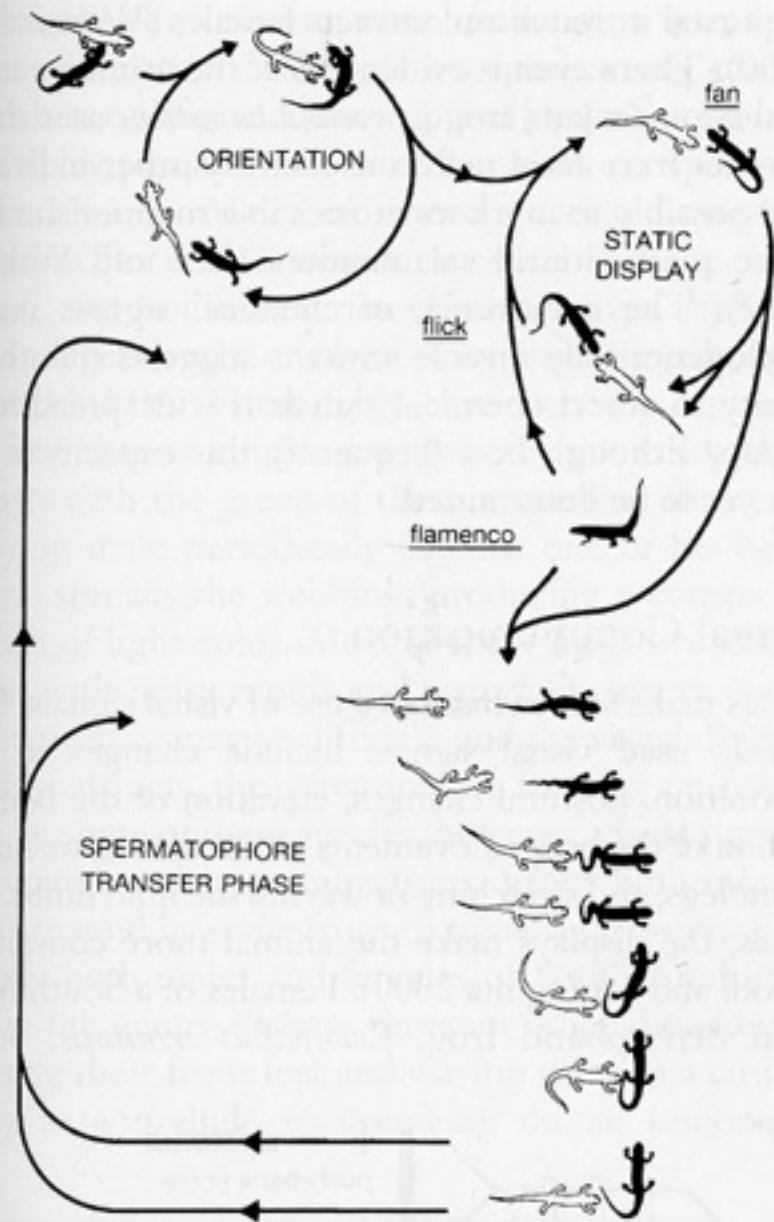






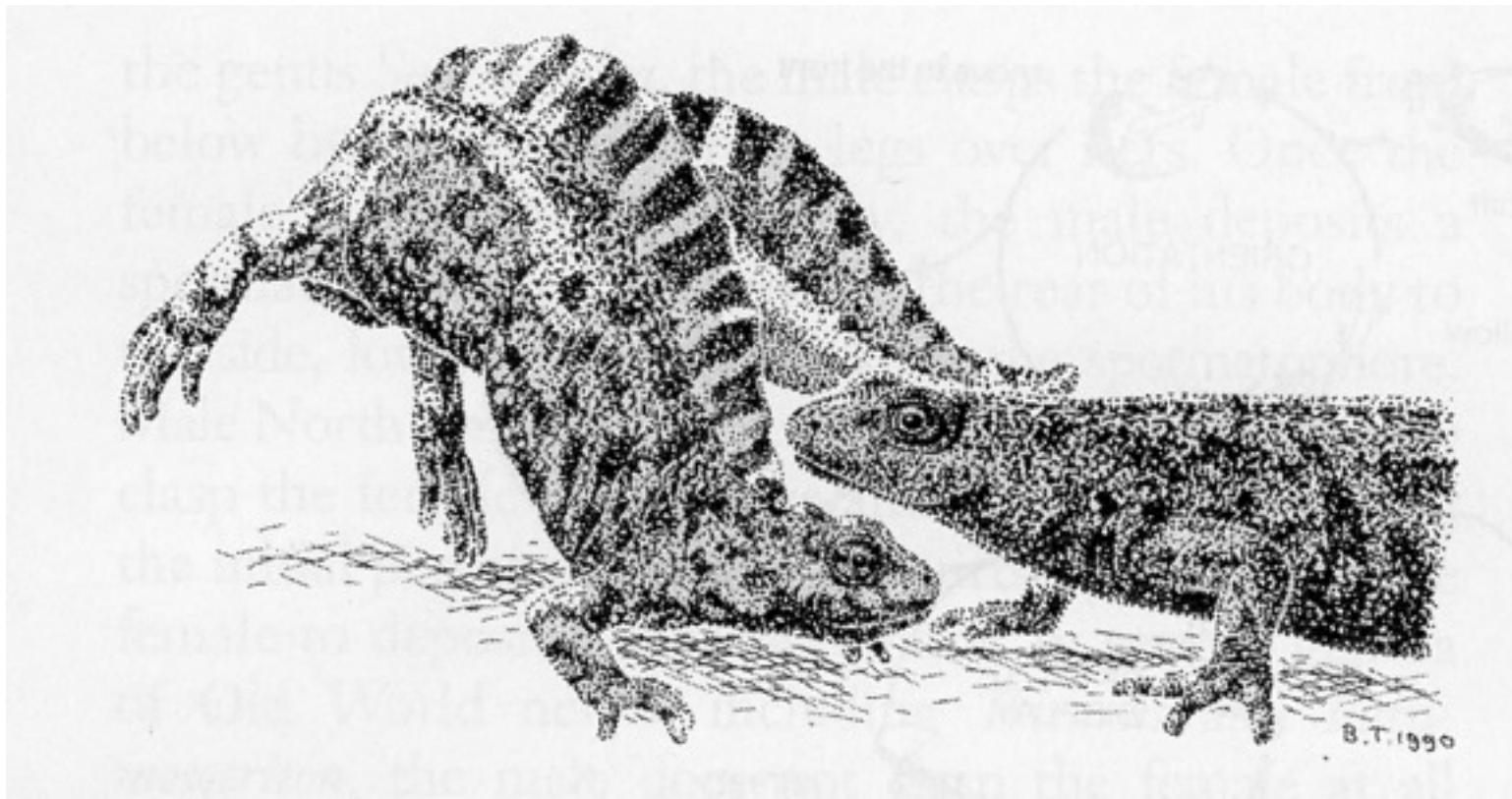
# Chemical Communicaiton in Salamandrids

- Chemical communication involving various glands and pheromones
- Physical contact (tactile communication) also common

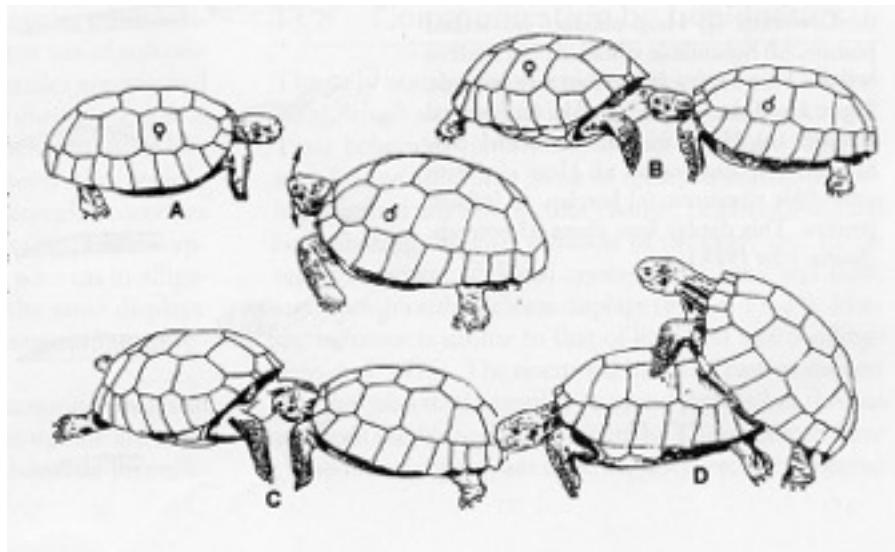
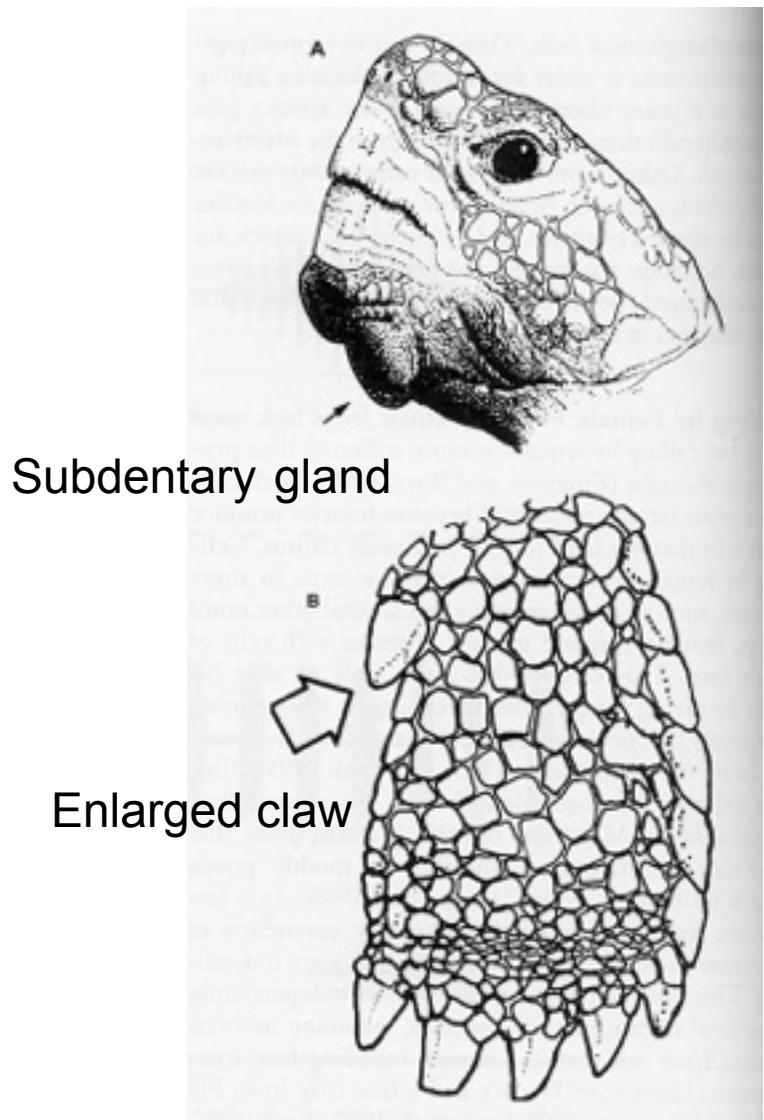


*Trituris boscai*

*Trituris vulgaris*



“Cat-buckle” display of marbled newt, *Triturus marmoratus*



Chemical communication in gopher tortoises (*Gopherus*)

Femoral pores  
in a male  
chuckwalla  
*Sauromalus*  
*ater*



# Chemical Communication in Snakes

- Most snakes rely heavily on chemical communication
- Male snakes do not produce signals to attract mates
- They use their vomeronasal organs to find females
- Can follow chemical trails over large distances



Mating ball of garter snakes (*Thamnophis sirtalis*) upon emergence from hibernacula

# Communication

- Chemical communication
- Acoustic communication
- Visual communication

# Acoustic Communication

- Most common in frogs
- Also seen in other species of herps
- Transmission distance depends on volume, frequency
- Not limited to air transmission

# Frog calls

- Most species of frogs have a unique, species-specific call
- Most species, only male calls
- Large vocal sacs = loud calls



*Hyla versicolor*



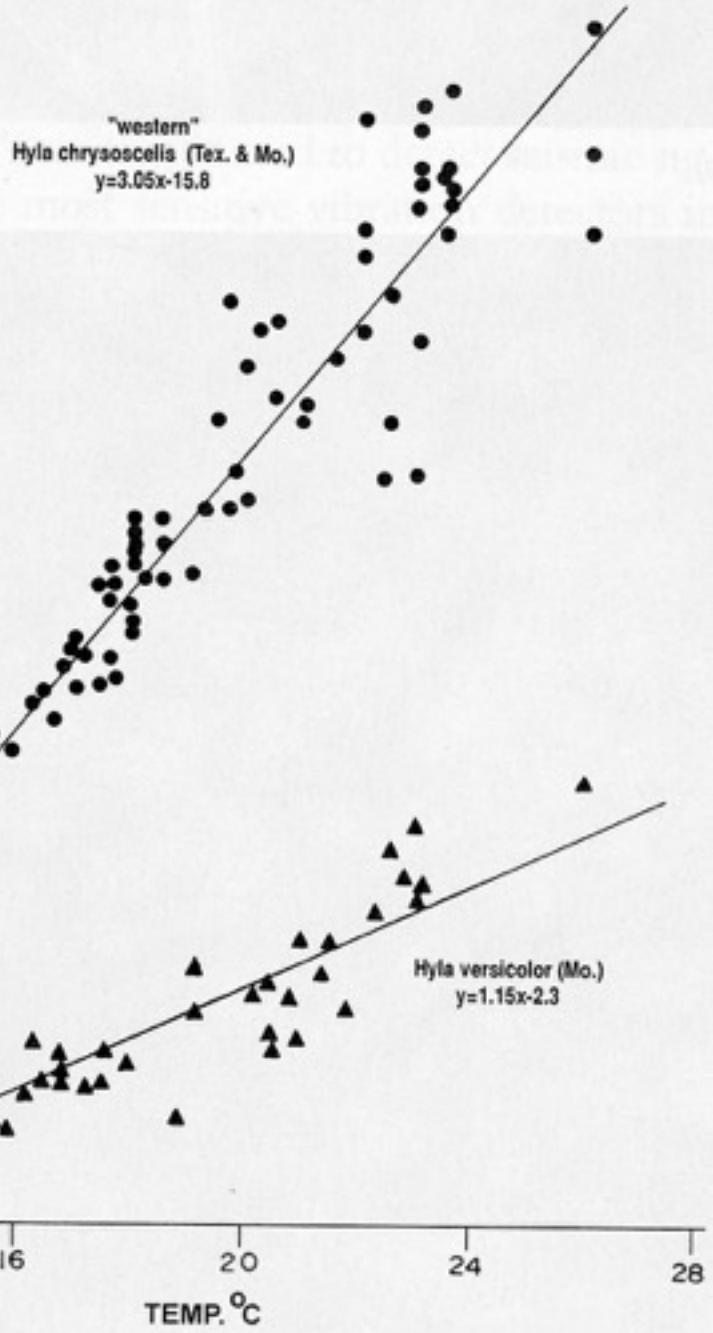
*Hyla chrysoscelis*



*Hyla versicolor*



*Hyla chrysoscelis*



Calling pulse rate in gray tree frogs depends on species and temperature

# Vocal Sac Diversity



Paired external - *Rana esculenta*

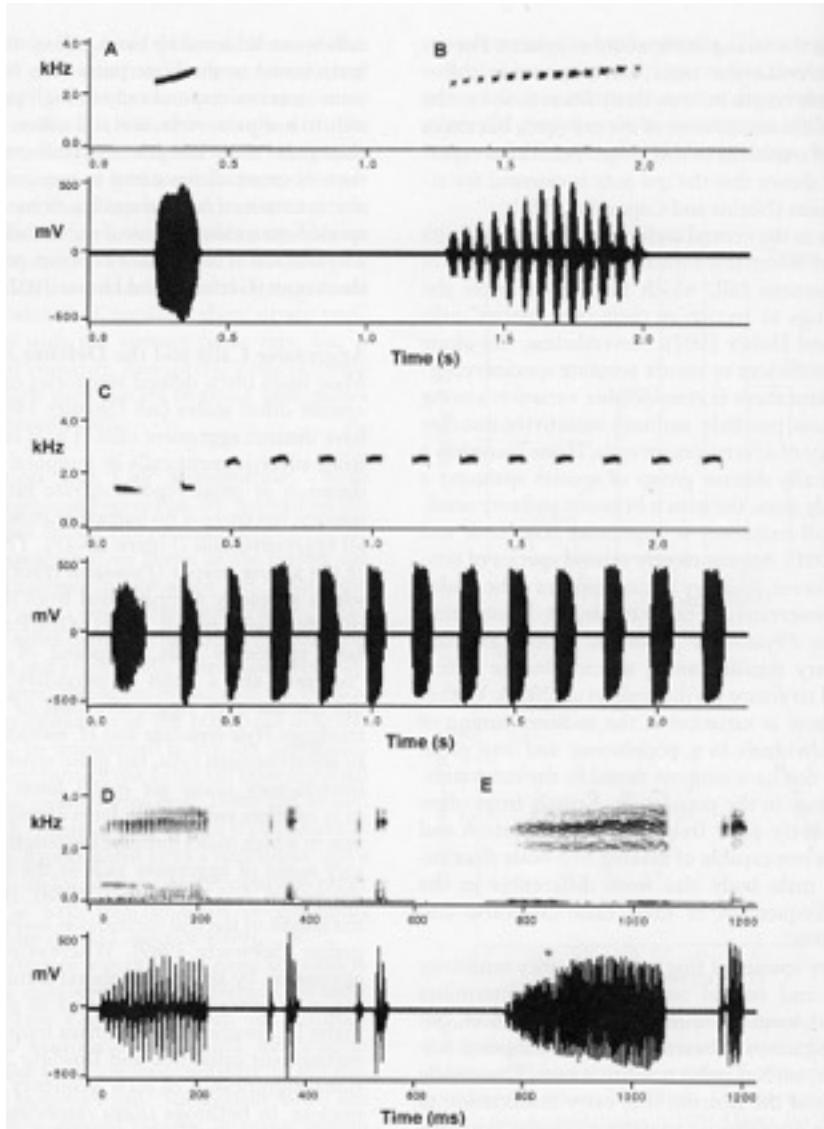


Median internal - *Rana clamitans*



Median external - *Litoria chloris*

# Variation in frog calls



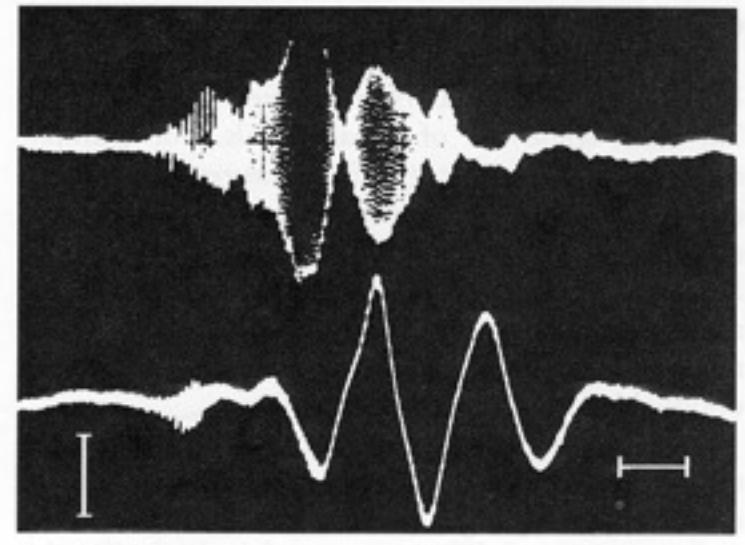
A. *Hyla versicolor*

B. *Eleutherodactylus coqui*

C. *Hyla microcephala*

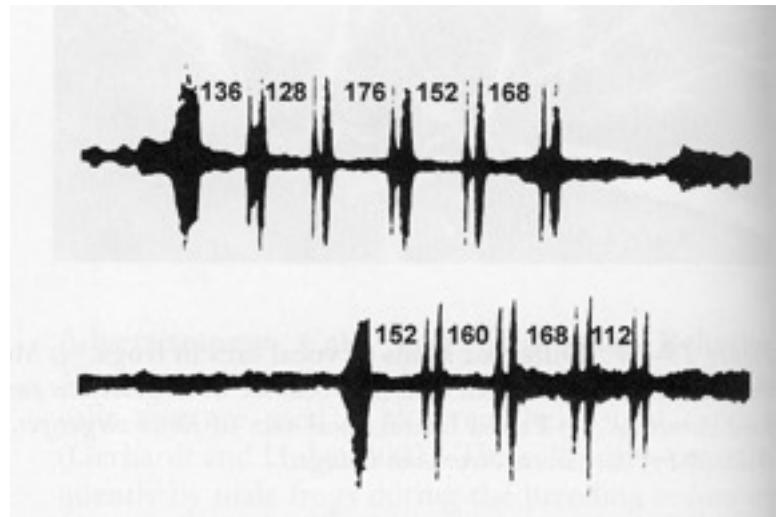
# Sound Transmission

- Have to make your call stand out from background noise
- Example:  
*Leptodactylus albilabris* transmits sound through air and ground.



# Sound Transmission

- Have to make your call stand out from background noise
- Example: *Hyla microcephala* alternate notes within calls



# Function of Frog Calls

- Locating mates at night
- Species recognition
  - Are you my species?
  - Sympatric frogs have distinct calls

# Function of Frog Calls

- Mate quality
  - Better frogs have louder, more frequent calls
  - “Honest signal” of quality
- Territoriality
  - Frogs often have a distinct aggressive call
  - Some have release calls

# Communication

- Chemical communication
- Acoustic communication
- Visual communication

# Visual Communication

- Animals have to make themselves visible against complex background
- Can use a few mechanisms:
  - Movement
  - Color

# Example: Anolis dewlap



*Anolis d. ocior*, Port Nelson, Rum Cay, Bahama Islands



*Anolis d. juliae*, western end, Ile-à-Vache, Haiti



*Anolis d. biminiensis*, western end, South Bimini Island, Bahama Islands



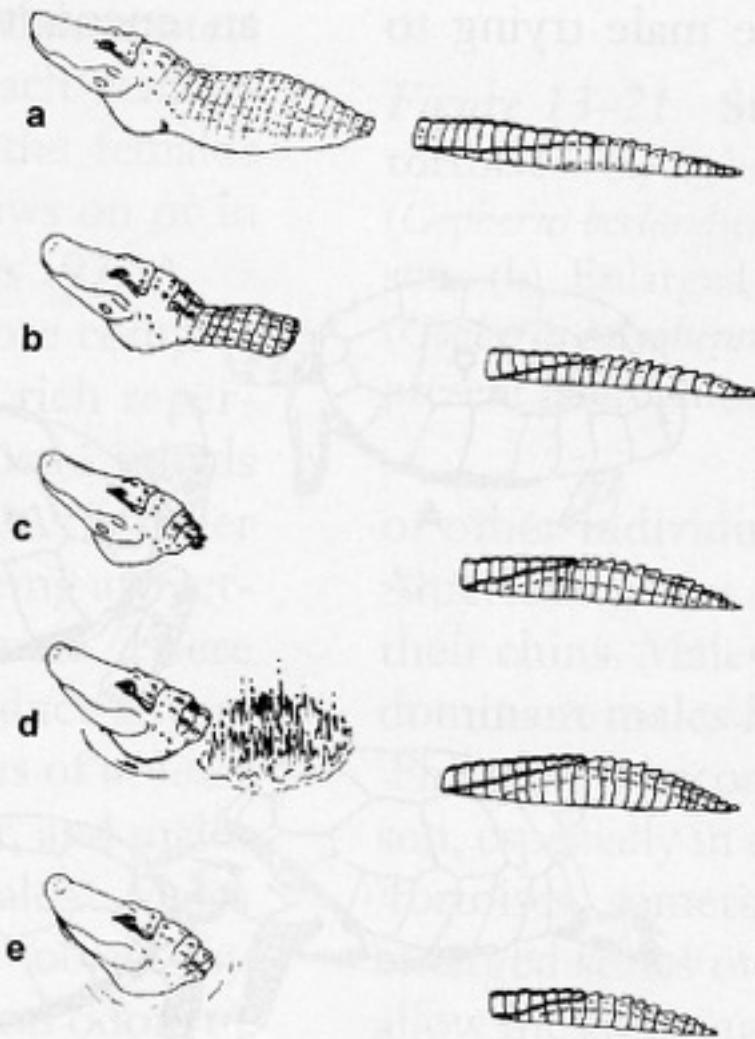
*Anolis d. favillarum*, 3 km NE Las Auyamas, 3300 feet, Barahona Province, República Dominicana

# Visual Communication in Frogs

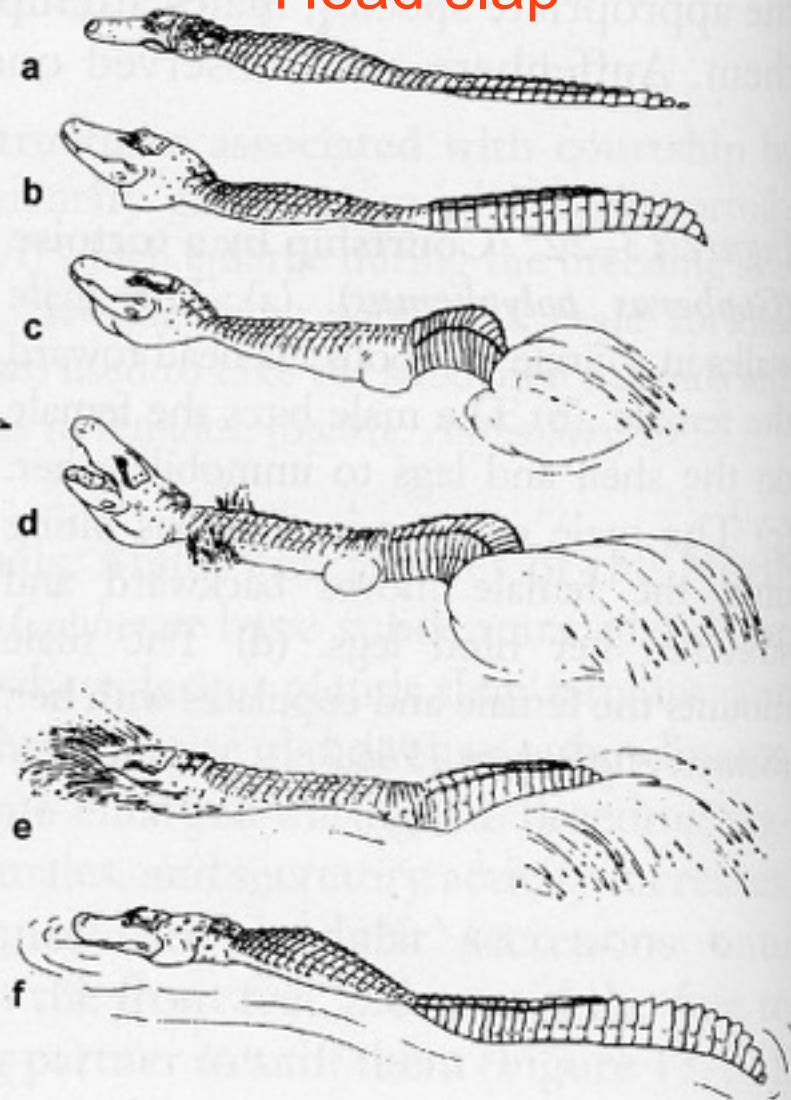
- Some frogs have prominent visual display
- Example: foot-flagging in *Hyla parviceps*



## Bellowing



## Head slap



Visual and acoustic communication in the  
American alligator (*Alligator mississippiensis*)



